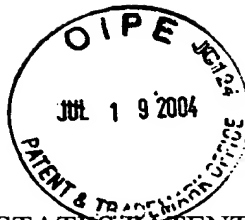


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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
SATOSHI KIKUCHI, ET AL. : EXAMINER: SCHILLINGER, L. M.
SERIAL NO: 09/846,255 :
FILED: MAY 2, 2001 : GROUP ART UNIT: 2813
FOR: CLEANING PROCESS FOR :
SUBSTRATE SURFACE :

REPLY BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

The following is a Reply Brief in reply to the Examiner's Answer dated June 14, 2004
(Answer).

Appellants disagree with the Examiner's finding under "(7) Grouping of Claims" that the Appeal Brief does not comply with the last sentence of 37 C.F.R. § 1.192(c)(7). While the argument for the dependent claims tracks the language of these claims, the argument asserts that the combination of Mehta and Verhaverbeke et al neither discloses nor suggests the subject matter of the particular claims. This is more than merely pointing out the differences in what the claims cover, and it is submitted, is consistent with *In re Beaver*, 13 USPQ2d 1409 (Fed. Cir. 1989).

The Answer is in violation of 37 C.F.R. § 1.193(a)(2), which proscribes the inclusion of a new ground of rejection. The Examiner relies on U.S. 5,167,761 (Westendorp et al), for the first time, to support the rejection of record. This is tantamount to a new ground of rejection. That the new prior art is not listed in the statement of the rejection is irrelevant;

reliance thereon is all that is necessary. "Where a reference is relied on to support a rejection, whether or not in a 'minor capacity,' there would appear to be no excuse for not positively including the reference in the statement of rejection." *In re Hoch*, 166 USPQ 406, 407 n.3 (CCPA 1970). See also MPEP 706.02(j). Nevertheless, Appellants submit that the present claims on appeal are patentable over the applied prior art, including Westendorp et al, as now addressed.

The Examiner relies on Westendorp et al in response to what the Examiner characterizes is Appellants' argument that "the dynamic mode does not equate to continuous flow of gases and that there is no evidence of record to support this" (Answer at 7).

In reply, Appellants have made no such argument. Rather, Appellants argued that the Examiner had not established that one skilled in the art would equate the pulse mode of Mehta with the static mode of Verhaverbeke et al, pointing out the respective differences (Appeal Brief at 7).

The Examiner appears to suggest that there are only two specific modes of etching, i.e., static mode and dynamic mode, while ignoring the fact that there is simply not only one static mode. Moreover, Westendorp et al is concerned with halide etching in the presence of water vapor, whereas water vapor (steam) is excluded by the presently-claimed process and in Mehta. In Westendorp et al's so-called "static method," a first gas is introduced into an etching chamber until a first pressure is reached and a second gas is subsequently introduced until a second higher pressure is reached (paragraph bridging columns 1 and 2). Westendorp et al discloses that their invention is an improvement over the prior art in that the quantity of reactive gas and the mixing ratio with other components present in the reaction chamber is no longer measured with a mass flow device, but is related to pressure, which provides improved accuracy over the prior art (column 2, lines 4-10). In sum, Westendorp et al is irrelevant herein.

Appellants disagree with the Examiner's finding that Verhaverbeke et al "teaches a very similar method" (Answer at 6). It is not clear whether the Examiner means similar to Mehta or similar to the present invention. Nevertheless, it is similar to neither, because Verhaverbeke et al is not concerned with selective removal of a low-density film that is present with a high-density film, and Verhaverbeke et al contemplates the inclusion of water, which is excluded by both Mehta and the present invention.

Regarding Appellants' argument that Verhaverbeke et al, in essence, teaches away from the dynamic mode, the Examiner points to various disclosure in Verhaverbeke et al which describes this mode, and points to Claim 12 (Answer at 7).

In reply, Appellants have already acknowledged Claim 12 of Verhaverbeke et al. But, the remaining disclosure of the dynamic mode in Verhaverbeke et al is with respect to the prior art. There is no embodiment with respect to their invention of including a carboxylic acid and employing a dynamic mode that is demonstrated therein.

In response to an argument that the Examiner characterizes as Verhaverbeke et al "does not teach the same etch chemistries as recited in Claim 1," the Examiner then states that Verhaverbeke et al was relied on to show that "continuous flows of gases (dynamic mode) and pulsed flows of gases (static mode) are known in the art and interchangeable methods of introducing HF gases and therefore are not novel and would be considered obvious variations" (Answer at 8).

In reply, such modes are **not** interchangeable, or at least not interchangeable for all etching applications, and Mehta is the best example of this. Indeed, as pointed out in the Appeal Brief, Mehta requires a very specific pulse-type technique. A continuous process is much less complex and economical, but is not even suggested by Mehta. Yet, Appellants have shown, with regard to Comparative Example 3 and the Examples in the specification, that the presently-claimed invention is superior the pulse-type technique of Mehta.

The Examiner finds that Appellants' claim language "fails to preclude the addition of a carboxylic acid," but that Verhaverbeke et al discloses an anhydrous etch without a carboxylic acid, relying on the disclosure at column 3, lines 10-30 (Answer at 8).

In reply, Appellants agree that the present claims do not preclude the addition of a carboxylic acid *per se*. But, Appellants have never argued otherwise. Appellants have simply argued that Verhaverbeke et al is drawn to the addition of a carboxylic acid, rather than as disclosing equivalence in different modes of etching, as a reason why one skilled in the art would not have combined Verhaverbeke et al with Mehta. Moreover, while column 3, lines 10-30 of Verhaverbeke et al describes nothing with regard to a carboxylic acid, this description is of the prior art and of the problems associated therewith, and if anything, teaches against the use of an etching regimen that excludes a carboxylic acid.

Moreover, to the extent the Examiner is relying on Verhaverbeke et al's description of the prior art at column 3, lines 10-30, see Comparative Example 1 in the specification herein, which is comparable to this prior art, since it demonstrates the use of anhydrous HF and steam, without the presence of an inert gas. As described in the specification at page 35, line 10 through page 38, line 13, the objects of the present invention cannot be achieved thereby.

Regarding the Examiner's finding that although Verhaverbeke et al "fails to teach an anhydrous etch without steam," Mehta "teaches an anhydrous etch without steam (or water vapor)" (Answer at 8), the Examiner has simply provided a reason why Mehta and Verhaverbeke et al would not be combined by a person of ordinary skill in the art.

The Examiner finds that Appellants have not explained how the comparative data of record show non-obviousness (Answer at 9).

In reply, Appellants have discussed Comparative Example 3 and the relevant disclosure thereof, at page 6 of the Appeal Brief. Yet, the Examiner has not commented on Comparative Example 3, except for the assertion that a reduced etching time is expected for a

dynamic mode compared to a static mode, relying on Westendorp et al at column 1, lines 35-40 and column 2, lines 25-30 (Answer at 9).

In reply, Westendorp et al does not support a finding that a dynamic mode necessarily provides the same etching results in less time compared to a static mode. Nevertheless, even if this were the case, the Examiner has not commented on any of the other advantages of the present invention demonstrated by the Examples in comparison to Comparative Example 3.

The Examiner finds that Appellants "[imply] that their "combination of [Mehta]'s etch chemistry with the conventional application of a continuous flow of gases, as taught by [Verhaverbeke et al], does not produce the Appellants' improved results. This argument is not persuasive, however, Appellant has provided no evidence of record as required to combat a *prima facie* case of evidence [sic]" (Answer at 10).

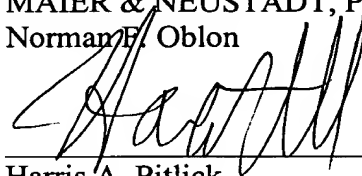
In reply, replacing Mehta's pulse-type technique with the continuous technique according to the present claims is Appellants' invention, which Appellants more than imply but vigorously assert, **does** produce unexpected results, and is not suggested by the applied prior art. The Examiner has not established that continuous flow of gases is conventional in processes involved in selective etching of a low-density film over a high-density film using anhydrous hydrogen fluoride gas as the etching gas. Indeed, the Examiner has made **no** *prima facie* case of obviousness herein. At best, the Examiner has established an "obvious to try" rationale.

"Obvious to try" has long been held not to constitute obviousness. *In re O'Farrell*, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988). A general incentive does not make obvious a particular result, nor does the existence of techniques by which those efforts can be carried out. *In re Deuel*, 34 USPQ2d 1210, 1216 (Fed. Cir. 1995).

Appellants continue to maintain that the rejection of record should be REVERSED.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.
Norman F. Oblon



Harris A. Pitlick
Registration No. 38,779

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
NFO/HAP/cja